

What is claimed is:

1 1. An apparatus for providing a one-to-one projection of emission
2 lithography, comprising:

3 a plate type emitter separated from a substrate holder by a predetermined
4 distance, the plate type emitter having a desired pattern on its surface facing the
5 substrate holder and being formed of a material selected from the group consisting of
6 pyroelectric and ferroelectric material;

7 a heating source for heating the plate type emitter; and

8 a plurality of magnets or DC magnetic field generators disposed outside the
9 emitter and the substrate holder, for controlling the path of electrons emitted from the
10 plate type emitter.

1 2. The apparatus of claim 1, wherein the heating source is a remote
2 controlled heater which generates infrared rays or a laser, or a contact heating plate
3 which uses electrical resistance heating.

1 3. The apparatus of claim 1, wherein the heating source heats the emitter
2 to a phase transition temperature or higher.

1 4. An apparatus for an x-to-one projection of emission lithography,
2 comprising:

3 a plate type emitter separated from a substrate holder by a predetermined
4 distance, the plate type emitter having a desired pattern on its surface facing the

5 substrate holder and being formed of a material selected from the group consisting of
6 pyroelectric and ferroelectric material;

7 a heating source for heating the plate type emitter; and

8 a deflection system disposed between the emitter and the substrate holder, for
9 controlling the path of electrons emitted from the plate type emitter.

1 5. The apparatus of claim 4, wherein the heating source is a remote
2 controlled heater which generates infrared rays or a laser, or a contact heating plate
3 which uses electrical resistance heating.

1 6. The apparatus of claim 4, wherein the heating source heats the emitter
2 to a phase transition temperature or higher.

1 7. The apparatus of claim 4, wherein the deflection system comprises:
2 a plurality of deflectors for deflecting electrons emitted from the emitter;
3 a magnetic lens disposed between the plurality of deflectors, the magnetic lens
4 focusing the emitted electrons; and
5 a diaphragm for passing electrons focused by the magnetic lens and filtering
6 out electrons drifting away from the focused electrons.

1 8. A method of providing a one-to-one projection of emission lithography,
2 comprising:

3 exposing a substrate to an emitter having a desired pattern on its surface facing
4 a substrate holder;
5 applying a voltage between the emitter and the substrate to allow electrons to
6 be emitted along a path from the emitter and applied to the substrate;
7 controlling the path of electrons using a plurality of magnets or DC magnetic
8 field generators disposed outside the emitter and the substrate holder; and
9 heating the emitter.

1 9. The method as recited in claim 8, wherein the heating step includes
2 heating the emitter by at least one of infrared rays, a laser, and an electrical resistance
3 heater.

1 10. The method as recited in claim 8, wherein the heating step includes
2 heating the emitter near to a phase transition temperature or higher.

1 11. A method of providing an x-to-one projection of emission lithography,
2 comprising:
3 exposing a substrate to an emitter having a desired pattern on its surface facing
4 a substrate holder;
5 applying a voltage between the emitter and the substrate to allow electrons to
6 be emitted along a path from the emitter and applied to the substrate;
7 controlling the path of electrons emitted from an emitter structure toward an
8 object to be etched, using a deflection system; and

1 12. The method as recited in claim 11, wherein the heating step includes
2 heating the emitter by at least one of infrared rays, a laser, and an electrical resistance
3 heater.

1 14. The method as recited in claim 11, wherein the controlling step includes
2 deflecting emitted electrons from the emitter, focusing the emitted electrons using a
3 magnetic lens, and after the focusing step, passing the emitted electrons through a
4 diaphragm to filter out electrons drifting away from a focus path of electrons.